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Lean management philosophy and its impact on employee attitudes and performance: the critical role of first line supervisors.

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ABSTRACT

Using a quantitative research design and survey data from 83 supervisor-employee dyads working in North American facilities of a large multinational healthcare organization, this study explores the critical role of first line supervisors in a lean environment. Many organizations have adopted the Toyota Production System (TPS, also known as lean management or the Toyota Way) in an effort to improve organizational effectiveness. Implementation success has been surprisingly limited. The predominantly negative effects documented in the scientific literature are attributable to the introduction of lean as a series of tools and techniques for cost cutting. In environments that truly manage according to the TPS, all share the belief that the development and participation of all employees is essential to maintain competitiveness. Increased emphasis on teamwork and worker involvement in a lean environment places rising demands on the first-line supervisor. The supervisor role in a lean environment is considered critical and becomes one of encouraging more participation, and creating an environment of continuous improvement. Given that leadership is a complex construct, the current paper uses a multi-domain approach proposed by Graen and Uhl-Bien (1995) to study the effect of empowering leadership behaviours (leader domain), leader-member exchange (relational domain) and psychological empowerment (follower domain) on individual performance (measured as in-role performance and organizational citizenship behaviours) through the mediating variable of job involvement in the work setting. Findings indicate that the role of the first line supervisor in a lean environment is critical. The follower (psychological empowerment) and relational (leader-member exchange) domains of leadership are significant in predicting variations of job involvement in the work setting, and job involvement mediates the relationship between the relation domain variable of leader-member exchange and individual performance (organizational citizenship behaviours targeted at the individual). Empowering leadership behaviours are significantly related and directly related to in-role performance. Development of first line supervisors should emphasize building high quality relationships, facilitating employee psychological

empowerment, and demonstrating empowering leadership behaviours in order to enhance involvement in a team setting and individual performance.

En utilisant une méthode de recherche quantitative ainsi que les résultats de sondages auprès de 83 dyades superviseur-employé travaillant dans des établissements nord-américains d'une grande organisation multinationale du domaine de la santé, cette étude explore le rôle clé des superviseurs de premier niveau dans un environnement de production « lean ». Plusieurs organisations ont adopté le Système de production Toyota (SPT, aussi connu sous les vocables de « lean management » ou de « méthode Toyota ») dans le but d'améliorer l'efficacité organisationnelle. De façon surprenante, le succès de l'implantation de cette méthode de production s'est montré limité. L'effet négatif prédominant documenté dans la littérature scientifique est attribuable à l'introduction du « lean » comme une série d'outils et de techniques pour réduire les coûts. Dans les environnements véritablement gérés selon le SPT, on partage la croyance que le développement et la participation de tous les employés est essentielle pour maintenir la compétitivité. L'accent sur le travail d'équipe et sur l'implication des travailleurs dans un environnement « lean » place des attentes élevées sur les superviseurs de premier niveau. Le rôle du superviseur dans ce type d'environnement est considéré comme critique et consiste à encourager la participation et la création d'un environnement d'amélioration continue. Étant donné que le leadership est un construit complexe, la présente étude utilise une approche multi-domaines proposée par Graen and Uhl-Bien (1995) pour étudier l'effet des comportements de leadership habilitant (*empowering leadership*; domaine du leader), de l'échange leader-membre (*leader-member exchange*; domaine de la relation) et de l'habilitation psychologique (*psychological empowerment*; domaine de l'employé) sur la performance individuelle (performance dans le rôle et comportements de citoyenneté organisationnelle) via la variable médiatrice de l'implication au travail, et plus spécifiquement dans l'environnement de travail (*job involvement in the work setting*). Les résultats indiquent que le rôle du superviseur est crucial. Les domaines de leadership de l'employé (c.-à-d. l'habilitation psychologique) et de la relation (c.-à-d. l'échange leader-membre) sont significatifs lorsqu'il s'agit de prévoir les variations de l'implication au

travail, et l'implication au travail agit comme médiateur entre les variables des domaines de leadership et la performance individuelle (comportements de citoyenneté organisationnelle). Le développement des superviseurs de premier niveau devrait mettre l'accent sur la formation de relations superviseur-supervisés de grande qualité et faciliter l'habilitation psychologique des employés afin d'encourager l'implication dans le travail d'équipe, et par le fait même, la performance individuelle.

Keywords: Lean manufacturing, leadership, empowering leadership behaviours, leader-member exchange, psychological empowerment, job involvement, organizational citizenship behaviours, in-role performance

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5S	Workplace organization method described by 5 Japanese words: seiri (sort), seiton (straighten), seiso (shine), seiketsu (standardize), and shitsuke (sustain)
ELB	Empowering Leadership Behaviours
IRP	In-Role Performance
JIR	Job Involvement – Role
JIS	Job Involvement – Setting
JIT	Just-in-Time
OCB	Organizational Citizenship Behaviour
OCBI	Organizational Citizenship Behaviour directed towards an individual
OCBO	Organizational Citizenship Behaviour directed towards the organization
TPS	Toyota Production System

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CHAPTER ONE - PROBLEMATIC

The fundamentals of lean management can be traced back to the Toyota Production System, developed by Taiichi Ohno, following the end of the Second World War. This production system focuses on the elimination of waste and excess in production processes. The most important aspect of the system that Ohno developed was focusing management on the workplace and eliciting wisdom and innovation from people in the workplace. Ohno was more interested in getting people to think for themselves than in telling them what to do; he underscored the crucial importance of motivating people in the workplace through inspirational leadership (Shimokawa & Fujimoto, 2009).

Interest by the Western manufacturing world in the Toyota System was limited until the publication of the book *The Machine that Changed the World* that coined the term 'lean manufacturing' for the Toyota Production System (Womack, Jones & Roos, 2007). With competition from the Japanese, North American manufacturers were looking for more modern manufacturing methods to reduce costs and improve efficiency. The majority of companies, however, emulated the techniques and tools of lean management without understanding the lean philosophy, and many attempts to convert to lean practices have failed. Very simply, for lean to succeed, it needs to be viewed as a philosophy and not a short-term strategy for cost savings (Bhasin & Burcher, 2006). It needs to permeate the culture and the thinking of the leaders of the organization and it needs to become a way of doing business. Lean management has, in much of the research literature, been treated as a neotayloristic management model that is not necessarily a healthy nor a productive work concept (Boje & Winsor, 1993). However, lean management is much more than the application of the tools and techniques (such as Kanban, JIT, Jidoka, 5S, standardized work, production leveling), which lead workers to believe that it is simply another way to squeeze more efficiency out of them.

The management principles of lean manufacturing steer the organizational form away from a command and control management system to a more flexible environment where teams that are closest to where the work is done determine the best methods and solve problems to improve quality and working conditions. Within this context, the role of

the first line supervisor has a critical bearing in the day-to-day conduct and decision-making regarding work and workers (Parry, 1997). Despite the importance of this role, very little research has been done on the supervisory role and its importance in lean management. This research project will attempt to elucidate the leadership behaviours required of first line supervisors, the type of relationship they must develop with subordinates, and the employee cognitions that should be encouraged for enhanced performance of individual employees in a lean environment.

CHAPTER TWO - THEORETICAL FRAMEWORK

To understand the theoretical framework for this research paper, an understanding not only of the origins of lean management, but also of the key characteristics of a lean environment, and the expected role of the employee and supervisor in such an environment is required. Therefore, this chapter will begin by providing the required background in lean management. A literature review of the key concepts included in the study, and the specific hypotheses that will be tested will follow, and the chapter will conclude with a presentation of the conceptual model for the present study.

1. LEAN ENTERPRISE MANAGEMENT

1.1 Mass production versus lean production

Following World War I, Henry Ford and Albert Sloan of General Motors revolutionized the automotive manufacturing processes transitioning from craft production to mass production, leading the US to dominate the global economy (Womack et al., 2007). Mass production was based on the scientific principles of Frederick Taylor. The scientific method Taylor advocated was the use of time and motion studies to determine the most efficient method for performing work. High specialization of workers and piece rate systems followed. In mass production, the idea of division of labour is taken to its ultimate extreme – typically, each employee has one task to perform, and does so repeatedly throughout the work shift. Emphasis is on doing the work as quickly as possible using methods designed by professionals outside the work group. Ford had huge success using this method and the North American car manufacturers became noted for high efficiency and low costs. In mass production, standardized products are churned out in very high volumes using expensive single purpose machinery. Because the machinery is expensive and, in most cases, cannot cope with disruptions, buffers are added in the process (extra materials, extra people, extra space) to assure smooth production. The result of mass production is a lower cost product for the customer, but at the expense of variety in the product offering and employee morale (due to the implementation of work methods that are boring and dispiriting for workers) (Womack et al., 2007). Workers on the shop floor in

this environment became interchangeable parts of the production system. Despite the economic success of methods adopted by Ford from the scientific method of Taylor, this type of management created dissatisfaction among the workers leading to labour unrest and a growing interest in the management literature on worker motivation and satisfaction. Hence, by the time of the great depression and the rise of labour unions, the issues of seniority and job rights were at the forefront and an ever-growing list of job rules led to a reduction in the efficiency of the mass production factories.

Following World War II, the Japanese car manufacturers were far behind the American manufacturers in terms of productivity and quality. Toyota undertook the challenge of catching up to the productivity standards of the American manufacturers. It was at this time that Taiichi Ohno, then working at Toyota's Koromo (Honsha) Plant, went to work on modifying the assembly process and created what is now known as the Toyota Production System (TPS). This production system was developed over many years and with much trial and error (Holweg, 2007). Ohno focused on the elimination of waste and excess in production processes. His methods came to be known as "lean" production with the publication of the book *The Machine that Changed the World* (Womack et al., 2007) as they eliminate waste in all aspects of the manufacturing process – including human effort, manufacturing space, capital investments, time, and inventory – as compared with mass production. Toyota, in fact, set out to copy Ford's mass production techniques but capital constraints and low volumes in the Japanese market did not justify the large batch sizes commonly used by North American car manufacturers. The advantages of small lot production with economies of scale in manufacturing under TPS went largely unnoticed for many years (Holweg, 2007). While Ohno is credited with inventing a new production concept, it was in fact a continuous learning cycle that spanned several decades. The Toyota Production System was not formally documented until 1965, and was not translated into English until 1977, with the publication of the article *Toyota Production System and Kanban System: Materialization of Just-in-Time and Respect-for-Human System* by Sugimori, Kusunoki, Cho and Uchikawa (1977). By this time, Toyota had a significant productivity advantage over US and European manufacturers. Their manufacturing

methods were widely referred under the nomenclature of 'just-in-time' manufacturing or the 'Toyota Way' until the first publication of the book by Womack in 1990.

Interestingly in the first English translation of TPS (Sugimori et al., 1977), the system is defined by the following two concepts:

> "First of all, the thing that corresponds to the first recognition of putting forth all efforts to attain low cost production is "reduction of cost through elimination of waste". This involves making up a system that will thoroughly eliminate waste by assuming that anything other than the minimum amount of equipment materials, parts and workers (working time) which are absolutely essential to production are merely surplus that only raises the cost.
>
> The thing that corresponds to the second recognition of Japanese diligence, high degree of ability and favoured labour environment is "to make full use of the workers' capabilities". In short treat the workers as human beings and with consideration. Build up a system that will allow the workers to display their full capacities by themselves." (p. 554).

The second concept, fundamental to TPS, emphasizes a style of leadership that demonstrates respect for people by eliminating wasteful movements, considering worker safety in job design, and allowing workers to display their capabilities by entrusting them with greater responsibility and authority in decision making (Sugimori et al., 1977). More and more western (particularly manufacturing) companies were emulating the Japanese methodology and techniques by this time, but the focus on a leadership that emphasizes respect for people appeared to get lost in translation. This is surprising given that these concepts were not totally new; as far back as the 1920's there were calls for an "appreciation of the importance of the human factor" (Gordon Watkins, 1922 as cited in Kaufmann, 1993, p. 21). The essence of the human relations perspective of the 1920's was that through effective motivation, communication and leadership in the workplace it is possible to create an organizational climate that promotes a mutuality of interests between management and labor and high levels of job satisfaction and productivity among employees (Kaufmann, 1993). These ideas were further developed by Elton Mayo, who

viewed human nature as being driven by emotion and not by reason. Mayo and Roethlisberger's documentation of the Hawthorne experiments are presented in many textbooks as the foundation of human relations theory. Managers need to be concerned with what motivates workers and why, thus moving into a role of team builder and facilitator to enhance both job satisfaction and productivity, and not just the latter (Lemak, 2004).

Another advocate of human relations theory was Mary Parker Follett. Follett saw the organization as a social setting whereby individuals and groups contribute to the overall success through participation in decision making. It is not enough to transfer formalized power; individuals must be directly involved in analyzing problems and implementing solutions. In this way, Follet moves away from the concept of a leader having power over a subordinate to the concept of sharing power with subordinates and developing their ability to be full partners in the organization (Eylon, 1998). While Follet was an American political scientist and philosopher, her work was more influential in Europe than in North America. It is not surprising then, given Follett's view of mutual problem solving, the use cross functional teams, and flatter organisational structures, that her philosophical view of empowerment foreshadowed the development of lean principles and the Toyota Way (Feldheim, 2004).

1.2 Lean Implementation and Lean Principles

There is a surprising amount of research on the cause of the failures related to the implementation of lean manufacturing, and on the negative impacts of lean practices on employees. Hasle, Bojesson, Lnagaa Jensen and Bramming (2012) performed a review of the literature on lean management in order to better understand its relationship with the working environment, and its effect on employee health, job satisfaction and commitment. Their review attempted to settle the ongoing debate on whether lean is mean, or a healthy and productive work concept. The results suggest that both negative and positive outcomes are present, however, the negative appear to dominate. These include lower job autonomy, higher demands, faster work pace, increased workload and augmented work intensity. In terms of effects on health, the authors report several studies linking lean to anxiety, stress and lower job satisfaction. While limited, positive effects, such as greater job autonomy, improved commitment, increased motivation and higher satisfaction were reported in some

of the studies reviewed. The authors suggest the ambiguity in the results stems from differences in implementation, practice and context. The predominantly negative effects reported may be attributable to the introduction of lean as a series of tools and techniques for cost cutting.

To properly understand lean manufacturing it is, therefore, necessary to look beyond the tools and practices and examine the system itself. The principles of lean have been clearly documented in the book *Lean Thinking* (Womack & Jones, 2003). The starting point for lean thinking is "value" as defined by the customer. Next is understanding the "Value Stream", which includes identifying all of the specific activities required to bring the product or service to the customer. Once the value stream steps have been identified, and the non-value tasks eliminated, it is necessary to make the remaining value creating steps "flow". Creating flow will engender an improvement in productivity and a cash flow windfall from reduced inventory and improved cycle times. Ongoing benefits come from introducing the fourth principle, "pull", which allows the organization to produce only what the customer needs. Instead of producing to a forecast, only product that has been sold will be replaced. The final and crucial aspect of the lean principles is "perfection", continuously striving for an ideal. As Holweg (2007) states "it is this dynamic learning capability that is at the heart of the success of the Toyota Production System" (p. 422). Any improvements made within a lean system are made in accordance with a standard scientific problem solving method, under the guidance of a teacher, at the lowest level possible within the organization. Frontline workers make improvements to their own jobs and their supervisors provide assistance. Organizations that manage according to TPS share the overarching fundamental belief that people are the most important corporate asset and that investment in their skills and knowledge is essential to building competitiveness (Spear & Bowen, 1999).

1.3 Lean Production, Lean Philosophy and Lean Enterprise

Lean has been used to describe many things including manufacturing processes, organizational culture, organizational philosophy and the management system. Lean production and lean manufacturing are used interchangeably to describe a production system that when implemented provides a way to produce more and more, with less and

less (less material, less effort) and comes closer and closer to providing customers with exactly what they want (Womack et al., 2007).

Lean philosophy, on the other hand, is concerned more about changing the way people think than with the elimination of waste in the individual processes. A company's philosophy is reflected in its management system (Mann, 2005). Management systems within a lean philosophy ensure that decisions are made at the lowest organizational level possible, closest to where the actual work is being done. As well, they nurture a learning environment (so critical to lean manufacturing) systematically focusing on the customer, and promoting lean leadership at all levels. This is accomplished through the use of visual lean metrics, daily accountability systems, leader standard work, and discipline (Mann, 2005).

The term Lean Enterprise is presented by Womack and Jones in their book *Lean Thinking* (2003) to describe the interaction required between all of the actors along the Value Stream, from the raw material supplier to the final end customer. The focus of all involved is on providing value to the customer. Lean Enterprise involves all functions within an organization (human resources, finance, engineering, supply chain, marketing, and sales) and all the suppliers and contractors that are connected in one way or another with the Value Stream.

This distinction of the terms is important as the organization involved in this study has implemented an Enterprise Management System with components that encourage behaviours to support their lean philosophy, the use of tools fundamental to lean manufacturing, and management systems that are common within all functions of the organization.

1.4 Prominence of the Team in a Lean Environment

Teamwork is an organizational approach that responds to the need for flexibility, adaptability and tight coupling in response to extremely competitive market conditions

(Tranfield & Smith, 2002). The fundamental idea underlying teamwork of all forms is the emphasis on responsiveness, flexibility and proactivity at both the individual and team level (*Ibid*). Womack and Jones (2003) make several assumptions about lean teams: 1) workers are multifunctional, 2) operators have greater responsibility for tasks such as quality control and routine maintenance that were previously under the responsibility of specialists, and 3) workers contribute to improvements through group problem solving. Several studies have looked at organizational designs for team working and have found that while the general archetype of self-directed work teams is extensively used in manufacturing organizations, the subtype used within lean organizations is quite different (Delbridge, Lowe & Oliver, 2000; Forza, 1996; Tranfield & Smith, 2002).

Lean production teams are tightly coupled because of the need to manage with low buffers of inventory between the individual processes, and because of the use of standard work. There is a need to coordinate behaviours within the system if the total process is to function effectively. In these environments, formal leaders co-ordinate team activities and interact with other parts of the production system (Tranfield & Smith, 2002). Autonomy in these environments occurs in the innovation mode, where employees choose which problems to resolve and how to resolve them (*Ibid*). Problem solving is organized around production teams. These teams have responsibility for monitoring quality, planning work activities and are committed to continuous improvement in all aspects of the operations (Cuther-Gershenfield, 1994; Tranfield & Smith, 2002). These are not self-directed work teams (given that a leader is present) but lean production teams that have ownership of their processes (Forza, 1996). These lean production teams are the type found within the organization in the current study.

1.5 Role of the Supervisor in a Lean Environment

The supervisor role has changed as manufacturing has moved from craft to mass to lean production. In craft production, the supervisor was considered the person in charge. With the shift to mass production and 'scientific methods', the supervisor became the person in the middle implementing management decisions affecting production operations (with little influence on the decisions made), and monitoring production (Mason, 2000). The flattening of the organization structure, increasing pressure on cost and quality, and the

emphasis on teamwork and worker involvement in lean production places increasing demands on the first-line supervisor. As a result, the role has considerably evolved and the task of supervision in a lean environment is more complex. While the front-line supervisor maintains a position of authority, the role has shifted from one of problem solver to one of facilitator and motivator (Mason, 2000; Olivella, Cuatrecasas & Gavilan, 2008). No longer strictly associated with quality control and scheduling, the supervisor role becomes one of encouraging more participation, and creating an environment of continuous improvement. In addition, tasks such as improvement activities, health and safety initiatives, training and discipline, previously the domain of middle managers have become the responsibility of first-line supervisors (Barton & Delbridge, 2006). Decentralization, participation in decision-making and continuous improvement are at the heart of lean – the role of the first line supervisor is, therefore, critical to success.

In the lean work environment, the supervisor is expected to demonstrate a leadership style that incites self-management, promotes empowerment, provides encouragement, and builds trust (Arnold, Arad, Rhoades & Drasgow, 2000). Hach (2009) reinforces this perspective indicating that the leadership skills required in a lean environment include behaviours that motivate, mobilize and manage change, set and communicate direction, enforce standards and the use of new work processes, create a culture of accountability, empower individuals and teams for action and coach individuals to enhance performance. The elements related to the first line supervisor leadership style will be explored in the current research.

2. KEY CONCEPTS AND HYPOTHESES

2.1 Leadership

Leadership is a much-studied phenomenon that has generated a great variety of definitions. A common definition, proposed by Yukl (2010), describes leadership in the following way:

> Leadership is the process of influencing others to understand and agree about what needs to be done and how to do it, and the process

> of facilitating individual and collective efforts to accomplish shared objectives. (p. 8)

The definition is general and only hints at the numerous theories that attempt to explain effective leadership. Several perspectives on effective leadership exist including competency; personality or trait; behavioural; situational or contingency; relational; and implicit theories. The competency perspective assumes that leaders possess specific competencies that make them effective, and individuals are able to develop the competencies required to become great leaders (e.g., Hogan & Kaiser, 2005; Mintzberg, 1995; Quinn, Faerman, Thompson, McGrath & St. Clair, 2007; Yukl, 2010). Proponents of the personality approach to leadership believe, contrary to the competency approach, that effective leaders are born and not made. Researchers of this perspective study the link between specific personality traits and leader effectiveness (e.g., De Vries, 2012; Kramer, 2003; Judge, Bono, Iles & Gerhardt, 2002; Judge & Piccolo, 2004). The behavioural approach, on the other hand, concentrates not on the personality of the leader but on what the leader does on the job, focusing on the identification of effective leadership behaviour. While several types of behavioural leadership have been researched, the most studied behavioural leadership theories are transformational and transactional leadership. In fact there have been more studies on transformational or charismatic leadership than all other leadership theories combined (Judge & Piccolo, 2004). The situational approach emphasizes the importance of contextual factors that influence leadership processes. According to this perspective, different attributes will be effective in different situations; therefore, effective leadership is determined by the situation. Contingency theory presumes there are separate outside forces that determine the leader's effectiveness. These forces may be environmental, organizational or cultural; or may be related to the group characteristics. Relational theories focus on the relationship between the leader and the subordinate. The quality of the relationship is assumed to influence the subordinate's attitudes. Implicit theories of leadership suggest the characteristics people look for in their leaders; in short how effective leaders are defined by their followers.

Graen and Uhl-Bien (1995) address this diversity in leadership theories and propose examining leadership through a three-domain approach, instead of examining leadership

from a single perspective such as behaviour, competency or trait. These authors suggest that considering leadership from the domain of the leader, the follower and the leader-follower dyad may provide a more balanced and powerful explanation of leadership than any one of the domains individually. In the leader domain, one finds behavioural approaches to leadership, where the primary focus is on the appropriate mix of personal characteristics and behaviours that would promote the desired leader outcomes. Leader outcomes may be defined as specific desired follower behaviours (organizational citizenship behaviours for example) that lead to enhanced performance. In the follower domain, the focus switches to the effectiveness of certain leadership styles on follower attitudes and hence on desired follower outcomes. Examples of followers' attitudes may include job satisfaction, perceived organizational support, or commitment that again leads to desired behaviours and hence, enhanced organizational performance. In the relationship domain of leadership theory, the focus is on the dyadic relationship between the leader and the follower. It considers the characteristics of this relationship, how the quality of the dyadic relationship is related to desired outcomes, and what behaviours are required on the part of leaders and followers for a high quality relationship. In several studies cited by Graen and Uhl-Bien, when leadership is assessed in the three domains, the variables taken in combination provide a more complete explanation and generate a more predictable variation in the leadership outcomes. In other words, "leadership is a multifaceted construct involving aspects of the leader, the follower, and the dyadic relationship between the two. Therefore investigations of leadership should focus on all these facets" (*Ibid*, p. 224-225).

The current study uses the three-domain framework proposed by Graen and Uhl-Bien to examine the leadership skills required of first line supervisors within a lean environment that lead to enhanced individual performance. In defining a lean environment as one where employees are empowered to drive continuous improvement, sustained competitive advantage comes from leaders combining technical skill and know-how with effective leadership skills in all three domains.

Several studies have examined the link between leadership and individual performance, and have demonstrated that the relationship is mediated by employee attitudes (Hogan & Kaiser, 2005). The current study will use this relationship of mediation as the

general research model (see Figure 1), where leadership includes the three domains of leader, relational and follower leadership.

Figure 1 – General Research Model

2.1.1 Leader Domain: Empowering Leadership Behaviours

In a lean environment, the management structure tends to veer away from a traditional structure to a flatter structure enabled by empowered work teams having ownership of the production process. This emphasis on teams leads to different requirements for leaders. Arnold et al. (2000) noted a paucity of research on the required behaviours for leaders of empowered teams despite the widespread popularity and use of such teams. Consequently, they developed a model for empowering leadership behaviours that are associated with effective team leadership in a team environment.[1] The behavioural categories and scale developed by Arnold et al. (2000) share more similarities with the behaviours of leaders of empowered teams described by Manz and Sims (1987, 1991), than with behaviours of the more popular theories of transformational leadership. These authors introduced the concept of 'SuperLeadership' whereby a "leader leads others to lead themselves" (p.18; 1991). The behaviours of empowering leaders are defined, therefore, by the shift in control from the leader to the team members.

Arnold et al. (2000) defined five categories of empowering leadership: participative decision making (encourage employees to express their ideas around issues at stake and provide them with opportunities for voicing these opinions); showing concern/interacting with the team (the extent to which the leader attends to each worker's needs and listens to

[1] Arnold et al. did not study leadership behaviours associated with perceptions of increased empowerment. Perceptions of empowerment (i.e., psychological empowerment) will be analyzed in the follower domain in a subsequent section of this paper.

their concerns, and encompasses the need for respect and recognition for their individual contributions); leading by example (the extent to which the leader is a role model, and demonstrates the leader's commitment to their own work as well as to the work of their team members); informing (dissemination of information about the organization's objectives, policies and practices, allowing employees to have a thorough understanding of their roles and responsibilities and how they contribute to the goals of the team); and coaching (the teaching or developing process through which an individual is supported while achieving a personal or team goal). While several required behaviours such as modeling appropriate behaviour, providing encouragement, and communicating a vision are shared with transformational leadership, empowering leadership is distinguished by behaviours whereby power is shared with subordinates (Srivasta, Bartol & Locke, 2006).

In the context under study in this paper, the first line supervisor sets goals and boundaries for the team, but allows the team to develop the methods and measurements to meet these goals. The basis of the lean environment is continuous improvement, and empowering leadership has been linked positively to continuous improvement in previous research (e.g., Carroll, 2001). Hach (2009) identified six core leadership behaviours in a lean environment, including empowering teams for action, communicating direction and coaching individuals, all three key elements of empowering leadership as defined by Arnold et al. (2000)

Several studies have linked empowering leadership behaviours to organizational performance through enhanced individual and team performance (Ahearne, Mathieu & Rapp, 2005; Huang, Liu & Gong, 2010; Raub & Robert, 2010; Srivasta et al., 2006; Vecchio, Justin & Pearce, 2010; Wang, Sui, Luthans, Wang & Wu, 2014; Zhang & Bartol, 2010). All of these studies indicate that the correlation of the leadership behaviours to performance is not necessarily direct, and as Graen and Uhl-Bien (1995) propose, a combination with other domains is necessary to fully understand the multifaceted concept of leadership. The two other domains are more fully explained in the following sections, beginning with the relation domain.

2.1.2 Relation Domain: Leader-Member Exchange (LMX)

A relationship-based approach to leadership emphasizes the dyadic relationship between the leader and the subordinate, focuses on the characteristics of this relationship and how it may be related to specific outcomes such as performance. The relationship people have with their supervisor is crucial to understanding and shaping their work experience (Martin, Epitropaki, Thomas & Topakas, 2010). Of the relationship-based approaches, Leader-Member Exchange (LMX) theory is the most prominent, developing over the last 50 or more years. LMX theory describes the dyadic process by which roles and expectations are developed between a leader and each subordinate (Dansereau, Graen & Haga, 1975; Graen & Cashman, 1975). The term member in LMX theory refers to the subordinate who is a member of the group that the leader manages. It is not a term used frequently in organizational psychology, but is employed within the concept of LMX to distinguish the leader from a member of the team, and to avoid the top down perspective that the term subordinate may imply, which is somewhat at odds with LMX theory. For simplicity, however, the term subordinate will be used interchangeably with the term member throughout this paper.

LMX theory breaks from approaches prevailing prior to the 1970's that generally assumed leaders treated all subordinates the same. It is rooted in the Vertical Dyad Linkage theory whose premise is that leaders develop relationships with subordinates of varying degrees of support and openness, and each relationship is unique. In a review of LMX research, Martin et al. (2010) indicate that one of the clearest definitions of the LMX concept comes from Scandura et al. (1986): "leader member exchange is (a) a system of components and their relationships (b) in both members of a dyad (c) involving interdependent patterns of behaviour and (d) sharing mutual outcome instrumentalities and (e) producing conceptions of environments, cause maps and value" (cited by Martin et al., 2010, p. 37). According to LMX theory, effective leadership is created through the dyadic relationship. It is rooted in social exchange theory (Brower, Schoorman & Tan, 2000; Graen & Uhl-Bien, 1995) and explains how the LMX relationship develops via a process of exchanging a variety of tangible and intangible commodities. The resulting relationships

range on a continuum of low quality LMX (based mainly on the employment contract), to high quality LMX (that extends beyond the job contract) (Martin et al., 2010).

In a meta-analytic study, Dulebohn, Bommer, Liden, Brouer and Ferris (2012) provide a theoretical framework summarizing 247 studies of LMX research. Their study examined the follower, leader and interpersonal relationship characteristics that influenced the quality of the LMX relationship and the resulting attitudes and behaviours of the relationship. One of the most interesting findings, according to the authors, was that leader behaviours and perceptions explained the most variance in LMX of all of the antecedents analyzed. As for the benefits of LMX, they are numerous (Dulebohn et al., 2012). The strongest average correlations, between LMX and its consequences, were with perceptual outcomes (such as procedural justice and empowerment), followed by attitudinal outcomes (satisfaction and commitment) and finally behavioural outcomes (such as job performance and organizational citizenship behaviours).

In the Dulebohn et al.'s (2012) meta-analysis, LMX was examined as a mediating and conceptually central variable. In the current study, it is proposed that LMX represents a complementary domain of leadership to empowering leadership behaviours (ELB) and employee psychological empowerment. Job involvement – an employee cognition – is proposed to be a mediator of the relationship between the three leadership domains and employee performance.

2.2 Employee Cognitions

2.2.1 Follower Domain: Psychological Empowerment

The domain approach to leadership of Graen and Uhl-Bien (1995) signifies that an understanding of leadership requires a focus not only on leader behaviours, but also on the follower and their relationship. A focus on followers involves looking at their cognitions or behaviours, in line with the concept of followership explored by various authors (e.g., Kelley, 1988; Meindl, 1995). In the present study, the leader behaviours are captured in the construct of ELB, and the quality of the relationship of the dyad is represented by LMX. Psychological empowerment, an employee cognition, will represent the follower domain given its pertinence to a lean environment.

Psychological empowerment has been conceptualized and studied by a large number of researchers and may be separated into two separate conceptions of empowerment. The first, shared by a large number of management theorists, regards empowerment as a set of techniques whereby authority is delegated to followers. This approach to empowerment, defined as the socio-structural approach, focuses on the policies and practices that lead to the sharing of power (Spreitzer, 2008). Practices that have been identified as contributing to empowerment include participative decision making, skill/knowledge based pay, open flow of information, flat organizational structures, and training. Conger and Kanungo (1988) argue that empowerment is not simply a process of delegation but a process of enabling, achieved through the enhancement of personal efficacy. In their operationalization of empowerment, managerial strategies and techniques such as modeling, goal setting and participative management, combined with the removal of organizational factors that lead to a psychological state of powerlessness, strengthen beliefs in personal efficacy resulting in desired behavioural effects (such as enhanced performance). In the current study, this conception of empowerment is addressed under the previously presented construct of empowering leadership behaviours.

In the second conception of empowerment, introduced by Thomas and Velthouse (1990), empowerment is viewed as an active work orientation. They describe empowerment broadly as increased intrinsic task motivation based on generalized beliefs regarding impact, competence, choice and meaningfulness. These global assessments are assumed to be generalizations from previous task assessments and thus represent an individual's accumulated learning. As explained by these authors, these assessments are the key cognitions, which are presumed to be proximal causes of intrinsic motivation.

Spreitzer (1995) follows this stream of research and further extends the approach focusing on empowerment as a psychological mindset, which includes four cognitions that reflect a proactive orientation towards one's role in the organization. These cognitions include meaning (a fit between the requirements of a work role and the beliefs and values of the individual); competence (an individual's belief in his or her capability to succeed in the activities required by the work, also referred to as self-efficacy); self-determination or autonomy (the sense of having a choice in initiating and continuing work behaviours); and

impact (the degree to which the individual can influence outcomes at work). Spreitzer demonstrates the validity of the four dimensions of empowerment and their contribution to an overall construct of psychological empowerment.

In reviewing the body of research on empowerment, Spreitzer (2008) indicates that the combination of the socio-structural and the psychological views of empowerment are important. Pointing to examples of employees working in environments where the structure, practices and policies create an empowering climate, but found to nonetheless demonstrate feelings of powerlessness, she indicates that each approach on its own will have little effect. The organizationally centric view of the socio-structural approach needs to be combined with the individually centric view of psychological empowerment for a full understanding of empowerment. The multi-faceted nature of empowerment requires an approach combining top-down mechanistic features which include setting direction, vision and goals and providing a formal organizational framework for the execution of tasks versus the organic approach which embodies a more bottom-up approach and focuses on trust, personal growth and risk taking of subordinates (Quinn & Spreitzer, 1997).

Psychological empowerment has been linked to a variety of positive outcomes such as task related performance and proactive behaviours. Workers who see themselves as competent and having some degree of autonomy are more likely to execute assigned job activities and innovate (Boudrias, Gaudreau, Savoie & Morin, 2009). The majority of authors, however, position psychological empowerment as a mediating variable between leadership behaviours, task characteristics, or organizational characteristics and affective or behavioural outcomes (Boudrias, Gobert, Savoie & Vandenberghe, 2003). The current study will propose a slightly different framework. As mentioned, psychological empowerment (PE) will be considered as the variable representing the follower domain of leadership, and therefore will be studied along with the leader (ELB) and relation (LMX) domains as independent variables predicting performance. The relationship between these leadership domains and performance will be mediated in the proposed model by job involvement, which is explored next.

2.2.2 Mediation through Job Involvement

A variety of definitions for job involvement have been presented in psychological and managerial literature. Paully et al. (1994) define job involvement as "the degree to which one is cognitively preoccupied with, engaged in, and concerned with one's present job" (p. 225). Since the introduction of the job involvement construct by Lodahl and Kejner in 1965 (Brown, 1996), a plethora of empirical studies have been conducted. Based on these studies Brown concludes, "increasing job involvement can enhance organizational effectiveness and productivity by engaging employees more completely in their work and making work a more meaningful and fulfilling experience" (p. 235).

The job involvement construct has often been confused with the similar yet distinct construct of work centrality. Work centrality, rooted in the Protestant work ethic, refers to the broad notion of the importance of one's work in general in one's life. Job involvement, on the other hand, is more specific and refers to concern with one's job. Paully et al. (1994) demonstrated that these were indeed two very different constructs, and furthered the understanding of job involvement by demonstrating that the latter consisted of two components: job involvement-role (JIR) and job involvement-setting (JIS) both of which are equally important in overall job involvement. JIR refers to the degree to which one is engaged in performing the tasks that make up one's job and JIS the degree to which one finds carrying out one's tasks in the present job environment to be engaging.

The meta-analytic study by Brown (1996) indicates that job involvement is substantially related to situational antecedent variables, in particular supervisory behaviours such as participation and consideration. Participative decision-making had the strongest relationship with job involvement than any of the situational variables studied. In the same study, Brown found that there was also a correlation between job involvement and performance (classified as a consequence in this meta-analysis); however the relationship was weak. In their study, Rotenberry and Moberg (2007), based on the limited support of the relationship between the attitude of job involvement and performance in previous studies, set out to demonstrate that this was due to the measurement scales used. Their study used the job involvement measure developed by Paullay et al. (1994) and focused on performance measures that distinguished between in-role performance (i.e. related to tasks)

and organizational citizenship behaviours (OCBs). OCBs are discretionary efforts to help others in the organization, or the organization itself, above and beyond the tasks required by their job description[2]. The results of their study demonstrate a significant correlation between job involvement and performance, both in-role and OCBs, with the most significant correlation observed between job involvement and OCBs directed at the individual supervisor. Their study however did not analyse the specific effects of each of the two components of job involvement (JIS and JIR) defined by Paullay et al. (1994).

It has been demonstrated that job involvement is an integral aspect of lean production processes (Wickramasinghe & Wickramasinghe, 2011). JIS, as mentioned previously, is the degree to which one finds carrying out the tasks in a particular environment to be engaging (Paullay et al., 1994). The specific items of the measurement scale estimate an individual's level of participation in team activities that improve the production process, as well as the level of effort that an individual is willing to invest in resolving team problems. Lean identifies employee participation as central to the philosophy, and employee involvement tends to be higher in lean production than in traditional manufacturing plants (Forza, 1996). The emphasis in JIS is on teamwork, which is of importance in a lean environment (as explained in section 1.4). In another study, Judeh (2011) found a relationship between job involvement and teamwork effectiveness. Based on these findings, the present study is interested in understanding the degree to which employees find carrying out their tasks in a lean environment, with an emphasis on teamwork, to be engaging (corresponding to the JIS component of job involvement). More specifically, we are interested in the extent to which JIS mediates the relationship between the three domains of leadership and individual performance.

[2] A more complete definition of OCBs can be found in section 2.3.1 concerning individual performance.

2.3 Outcomes

2.3.1 Employee Individual Performance

There are two separate dimensions of employee performance: in-role and organizational citizenship behaviours. In-role performance (IRP) refers to how well a person performs activities that are directly related to their job description and also includes the degree to which an employee complies with the policies and regulations of the organization. An organizational citizenship behaviour (OCB) is defined as a "behaviour that is discretionary, not directly or explicitly recognized by the formal reward system, and that in aggregate promotes the effective functioning of the organization" (Organ, 1988, p. 4). Katz (1964) noted over fifty years ago that spontaneous employee innovation was necessary for organizational success, and hence, noted a growing interest by managers in employee activity that went beyond the role requirements and significantly contributed to achieving organizational objectives. According to Katz (1964), "if the system were to follow the letter of the law according to job descriptions and protocol, it would soon grind to a halt" (p. 133). Organ's definition led to much discussion as behaviours that were traditionally thought of as being above and beyond the job description ("extra-role") began to be recognized within the formal reward system. As a result, Organ (1997) revised his definition of OCBs to "performance that supports the social and psychological environment in which task performance takes place" (p. 95). The advantage of this revised definition is that it maintains the distinction between task performance and OCBs but avoids some of the difficulty in viewing OCBs as discretionary behaviours for which an employee was not compensated (Podsakoff, Whiting, Podsakoff & Blume, 2009).

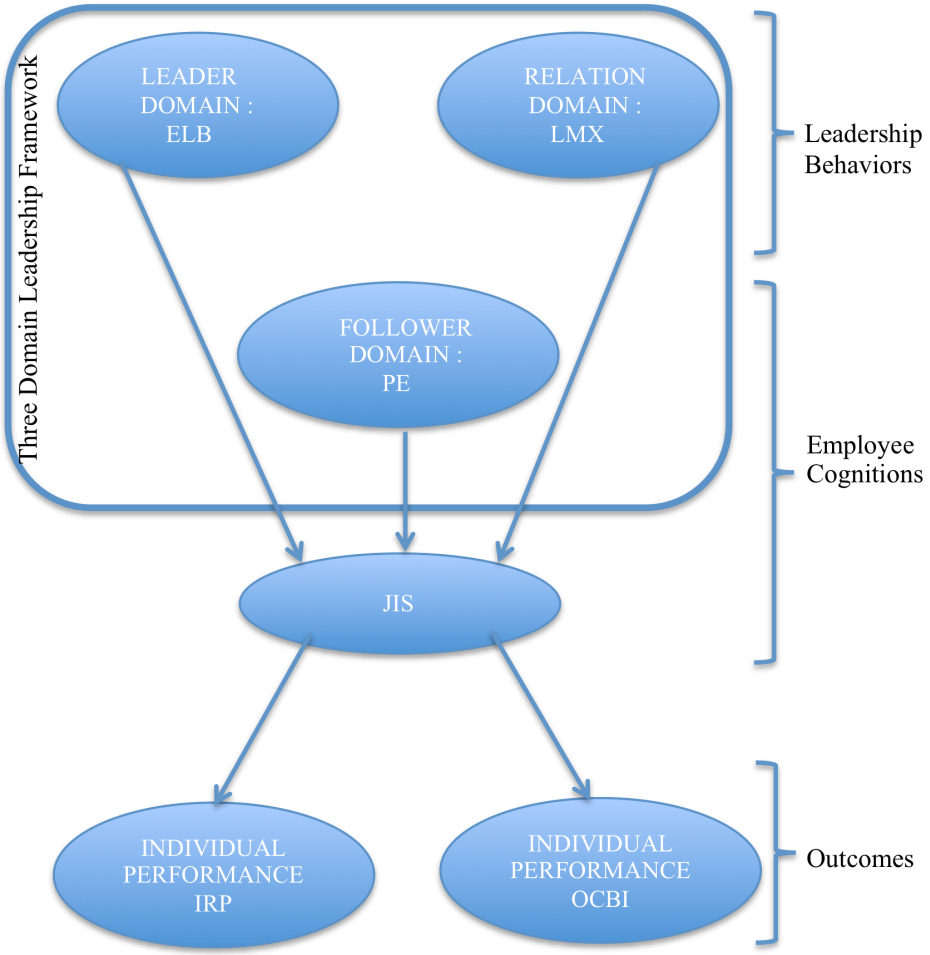
Over the years, the dimensions of OCBs have evolved. In a critical review of the empirical research on OCBs, Podsakoff, MacKenzie, Paine and Bachrach (2000) integrated the variety of definitions and dimensions of OCBs from previous literature into seven dimensions: helping behaviour, sportsmanship, organizational loyalty, organizational compliance, individual initiative, civic virtue and self-development. Williams and Anderson (1991) were the first to distinguish between behaviours oriented towards the individual (OCBI) and those oriented towards the organization (OCBO). OCBOs benefit

the organization in general and include such elements as giving advance warning when unable to come to work and adhering to informal rules devised to maintain order. OCBIs, on the other hand, include behaviours that immediately benefit specific individuals and through this indirectly contribute to the organization. Factors of OCBIs include helping others who are absent, and taking a personal interest in other employees. Williams and Anderson (1991) demonstrated that in-role behaviours (IRP), OCBIs, and OCBOs are separate dimensions of performance that can be assessed using supervisory ratings. For the purposes of this paper, given the research concentrates on the supervisor's role and leadership, IRP and OCBIs will be the main focus.

Numerous studies have been performed in order to identify the antecedents of OCBs. Initial research concentrated mainly on personality traits, dispositions and employee attitudes (Bateman & Organ, 1983; Organ, 1988; Smith, Organ & Near, 1983). More recent research offers a larger perspective investigating social ties and variables related to the organizational context. In their critical review, Podsakoff et al. (2000) provide a meta-analysis of 42 variables and their relationship to the most common dimensions of OCBs. The results indicate that job attitudes, task variables and various types of leader behaviour appeared to be the main antecedents of OCBs in general. More specifically, trust in the leader, quality of LMX relationship and leader supportive behaviours demonstrated the highest correlations with overall OCBs, providing support for the multi-domain perspective of leadership.

3. CONCEPTUAL MODEL AND HYPOTHESES

Figure 2 – Conceptual Research Model



Note: ELB = Empowering leadership behaviours, LMX = Leader-member exchange, PE = Psychological empowerment, JIS = Job involvement in the work setting, IRP = In-role performance, OCBI = Organizational citizenship behaviours targeted at an individual.

This study is guided by the broad proposition that leadership influences employee cognitions, which in turn affect employee behavioural outcomes. The role required of first line supervisors for enhanced individual performance in a lean environment is situated in three leadership domains: empowering leadership behaviours (ELB) in the leader domain, LMX in the relation domain, and psychological empowerment (PE) in the follower domain.

The combined effect of these three domains is proposed to have a significant relationship to individual performance (both in-role and OCBIs), through the mediating variable of job involvement in the work setting (JIS). The study proposes that using the multi-domain perspective of leadership provides a more complete view of the leadership required of first-line supervisors in a lean environment. In summary, the following hypotheses will be tested:

Hypothesis 1: The relationship between the leader (ELB), relational (LMX) and follower (PE) domains of leadership and in-role performance (IRP) will be mediated by job involvement-setting (JIS).

Hypothesis 2: The relationship between the leader (ELB), relational (LMX) and follower (PE) domains of leadership and organizational citizenship behaviours directed at individuals (OCBIs) will be mediated by job involvement-setting (JIS).

To facilitate reporting of the results, the two main hypotheses will be subdivided as follows:

Hypothesis 1a: The leader (ELB), relational (LMX) and follower (PE) domains of leadership will be related to job-involvement setting

Hypothesis 1b: The leader (ELB), relational (LMX) and follower (PE) domains of leadership will be related to in-role performance (IRP)

Hypothesis 1c: Job-involvement setting (JIS) will mediate the relationship between the three leader domains and in-role performance (IRP)

Hypothesis 2a: The leader (ELB), relational (LMX) and follower (PE) domains of leadership will be related to job-involvement setting

Hypothesis 2b: The leader (ELB), relational (LMX) and follower (PE) domains of leadership will be related to organizational citizenship behaviours directed at individuals (OCBIs).

Hypothesis 2c: Job-involvement setting (JIS) will mediate the relationship between the three leader domains and organizational citizenship behaviours directed at individuals (OCBIs).

CHAPTER THREE - RESEARCH METHOD

1. RESEARCH SETTING AND PARTICIPANTS

The organization participating in the study is a large multinational healthcare organization with over 60,000 employees. With manufacturing facilities around the world, the company develops, manufactures and distributes products that save and sustain lives across the globe. Lean Enterprise management is the fundamental management philosophy of the global manufacturing organization, and incorporates the key fundamentals of lean management. The study was conducted in North American facilities in order to simplify the data collection and to ensure national culture similarity. Working with the human resources staff in the facilities, participants were invited to complete the survey questionnaires.

Two groups were invited to participate in the study: first line supervisors and their employees. Participation was voluntary, and the research methodology was approved by the ethics committee at the University of Sherbrooke (the certificate is included in Appendix A). The data was collected using self-administered questionnaires, using 5-point Likert-type scales, from matched supervisor-employee pairs. The survey instruments are described in some detail below and the full scales are presented in Appendices B and C.

Data collection was performed in two phases. First, employees at the various manufacturing locations were invited by HR representatives to participate in the study. The employees were asked to indicate their names on the questionnaire as well as the name of their supervisor. This method limited the implication of the HR representatives of the organization. It also allowed for the pairing of the supervisor and employee by the researcher, which was required in analyzing the relationship between the employee and supervisor. All questionnaires were returned in pre-addressed envelopes directly to the researcher to provide reassurance on the confidentiality of the responses. Once the employee questionnaires were received, and the list of supervisors identified, the supervisor questionnaires were then distributed. The supervisors were asked to fill out a questionnaire for only those employees that participated in the study, limiting unnecessary evaluations.

Data from the employees was collected from October to December 2013, and data from the supervisors from January to March 2014. Four hundred (400) employee surveys

were sent out to eleven manufacturing facilities. Due to specific contextual factors, one facility decided not to participate in the study, therefore, a total of 10 facilities participated in the survey. Of the 400 surveys distributed to employees, 195 were returned (48% response rate), 37 surveys were not usable due to incongruities or missing data, leaving 158 useable employee surveys. There were 77 supervisors for the 158 employees (an average of 2 employees per supervisor). Thirty-five (35) first line supervisors completed and returned the survey (a response rate of 45.5%), providing 83-paired questionnaires. The final sample is thus composed of 83 supervisor-employee dyads.

2. MEASURES

All of the variables included in the model have been the subject of theoretical interest and/or have empirical support which increases the possibility of comparing results of this research with those of previous studies (Ouakouak & Ouedraogo, 2013). As the surveys were distributed to English-speaking facilities within North America, there was no need for translation of the items. All questions were rated using a 5-point Likert scale: participants were asked to indicate their level of agreement to each of the statements (1=strongly disagree, 5= strongly agree).

2.1 Leader Domain

2.1.1 Empowering Leadership (Employee survey)

A 20-item version of the Empowering Leadership Questionnaire (Arnold et al., 2000) was used, with employees rating their perception of the empowering leadership behaviours demonstrated by their supervisors. Their best fitting model for Empowering Leadership included the following five factors: leading by example, participative decision-making, coaching, informing, and showing concern. Due to considerations concerning the length of the questionnaire, the original 38-item scale was modified to include a total of 20 items, with a minimum of 3 items per factor. Items were chosen based on appropriateness to the specific context of the study. Because the subscales for the five leadership behaviours are highly correlated (*Ibid*), the subscales were combined as a single empowering leadership measure. Sample items include "(My supervisor) sets a good example by the

way he/she behaves", "(My supervisor) listens to my work group's ideas and suggestions", "(My supervisor) suggests ways to improve my work group's performance", and "(My supervisor) explains company goals".

2.2 Relation Domain

2.2.1 LMX (Employee Survey)

LMX was measured from the perspective of the subordinate using the LMX-7 scale adapted by Scandura and Graen (1984). The validity of the LMX-7 scale was supported by Graen and Uhl-Bien (1995), who recommended the seven-item LMX measure as the "most appropriate and recommended measure of LMX" (p. 236), in their review of LMX instruments. Sample items include: "I know where I stand with my leader, how satisfied my leader is with me" and "My working relationship with my leader is extremely effective".

2.3 Employee Cognitions

2.3.1 Follower Domain - Psychological Empowerment (Employee survey)

The 12-item questionnaire for measuring psychological empowerment conceived by Spreitzer (1995) was used in the employee survey. The scale measures psychological empowerment through four dimensions: meaning, competence, self-determination, and impact. Sample items include: "The work I do is very important to me", "I have mastered the skills necessary for my job", "I can decide on my own how to go about doing my work", and "My impact on what happens in my workgroup is large".

2.3.2 Mediator - Job Involvement-Setting (Employee Survey)

Several measures of job involvement exist. Recent research suggests the use of Paullay et al.'s (1994) measurement scale as it is the only scale that does not confound job involvement with work centrality (Diefendorff et al., 2002; Rotenberry & Moberg, 2007). The component of job involvement-setting was assessed by employees using Paullay et al.'s (1994) fourteen item measurement scale. Sample items include "I feel myself to be part of the team on which I work", "This work environment really inspires the very best in me in the way of job performance", and "I am willing to put in a great deal of effort beyond that normally expected in order to help my team be successful".

2.4 Outcomes

2.4.1 Individual Performance (Supervisor Survey)

Supervisors were asked to rate their employees' performance. In-role performance was evaluated using the six-item scale developed by Williams and Anderson (1991). Items include: "This employee adequately completes assigned duties", "This employee meets the formal performance requirements of the job" and "This employee performs tasks that are expected of him/her". OCBI performance was evaluated by seven items of the same scale developed by Williams and Anderson (1991). Examples of items include "This employee helps others who have been absent", "This employee goes out of his/her way to help new employees", and "This employee helps others who have heavy workloads".

2.5 Socio-demographic variables

Information on several socio-demographic variables was collected from both the employee and supervisor. Analysis will be performed on the variables to determine if any of the variables should be included as control variables. Based on previous research, it was decided that the following information be included in the questionnaires: gender, age, and tenure, for both supervisor and employee; relationship tenure on the employee survey; and length of time since lean implementation on the supervisor survey (Landry & Vandenberghe, 2012)

3. PROCEDURE

Statistical software SPSS version 20 was used for all tests. Descriptive statistics and bivariate correlations are provided in the following chapter. All constructs are reflective, signifying that the indicators included in the measurement scales are: manifestations of the construct; are interchangeable; share a common theme; and are expected to covary with each other (Jarvis, Mackenzie & Podsakoff, 2003). Hence, reliability statistics (Cronbach alpha's) will be used to confirm the internal validity of the measurement scales. Hierarchical multiple linear regression analysis, as proposed by Baron and Kenny (1986)

for testing mediation, will be used to test the hypotheses. According to this method, a significant relationship between the independent variables and the mediating variable must be demonstrated. Second, the independent variables must be significantly associated with the dependent variable. And finally, the relationship between the independent variables and the dependent variable should either disappear or be greatly diminished when the mediating variable is included in the analysis (James, Muliak & Brett, 2006). These three steps are represented in the detailed hypotheses (i.e., a, b, and c).

CHAPTER FOUR – ANALYSES AND RESULTS

1. PRELIMINARY ANALYSES

The average age of employee respondents was 42.35 years, 40.1% were male and 59.9% female; the average organizational tenure for all employee respondents was 11.38 years. The average age of supervisor respondents was 42.22 years, 51.3% were male and 48.7% female, and the average organizational tenure was 10.35 years. Across facilities, the average number of years since the implementation of the lean enterprise management system, evaluated by supervisors, was 4.29. There was a considerable amount of variation in the length of time that the employee and supervisor had been working together. On average, the relationship duration between the supervisor and subordinate was 2.55 years. Tables 1 and 2 summarize the socio-demographic data, providing the means, standard deviations, ranges, and gender distribution.

Table 1 – Descriptive Statistics of the samples

	Mean	Min	Max	SD
Age in years (employee)	42.35	20	67	11.74
Tenure in years (employee)	11.38	0.17	43	11.24
Relationship tenure	2.55	0.08	25	3.60
Age in years (supervisor)	42.22	26	62	10.45
Tenure in years (supervisor)	10.35	0.92	44.67	8.66
Number of years since lean implementation	4.29	1	14	3.16

Table 2– Gender Distribution within the samples

Sample	Male	Female
Employees	40.10%	59.90%
Supervisors	51.30%	48.70%

Significance was set at 0.05 for all statistical analyses performed, unless otherwise noted. Reliability of each of the measurement scales was verified with an analysis of the Cronbach alphas. A summary of the data is presented in Table 3. The Cronbach alphas were all above 0.8 indicating that the measurement scales are very good (>0.8) to excellent (>0.9) and, therefore, measure the constructs with consistency.[3]

Table 3– Scale Reliability Statistics

Construct	Cronbach's Alpha	Number of Items
LMX	0.94	7
ELB	0.98	20
PE	0.87	12
JIS	0.90	14
IRP	0.86	6
OCBI	0.94	7

Table 4 - Bivariate Correlations

	Employee Age	Employee Tenure	Supervisor Age	Supervisor Tenure	Relationship Tenure	Lean Tenure	ELB	PE	LMX	JIS	IRP	OCBI
Employee age	1											
Employee Tenure	.593**	1										
Supervisor Age	.395*	.388*	1									
Supervisor Tenure	.394*	.452**	.580**	1								
Relationship Tenure	.271**	.285**	.573**	.504**	1							
Lean Tenure	.038	-.102	-.058	-.037	-.078	1						
ELB	-.216**	-.231**	.031	-.055	-.112	.161	1					
PE	-.019	.025	.294	-.089	.008	.192	.274**	1				
LMX	-.212**	-.203*	.080	.005	-.091	.087	.882**	.255**	1			
JIS	-.198*	-.231**	-.117	-.061	-.145	.083	.438**	.543**	.465**	1		
IRP	-.186	-.043	.158	-.124	-.101	.044	.355**	.161	.358**	.246*	1	
OCBI	-.160	-.078	.262	-.086	.041	.133	.248*	.099	.301**	.330**	.637**	1

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

[3] Classification of Cronbach alphas based on MQG 810 course manual, p.385

Several significant correlations among the study variables were observed[4]. The bivariate analysis of the independent leadership domain variables indicates that LMX and ELB are very strongly correlated (r=0.88), while LMX and PE, as well as ELB and PE, are weakly correlated (r= 0.26 and r=0.27 respectively). The three independent variables are also all significantly correlated to the proposed mediating variable of JIS. PE is strongly correlated (r=0.54), while ELB and LMX are modestly correlated (r=0.44 and r=0.47 respectively). The two dependent variables of IRP and OCBI included in the study are strongly correlated (r=0.64), while JIS is weakly correlated to IRP (r=0.25), and modestly correlated to OCBI (r=0.33). Two of the three independent leadership domain variables are significantly correlated to the individual performance variables: ELB and LMX are modestly correlated to IRP (r=0.36 for both), while LMX is modestly correlated (r=0.30) and ELB is weakly correlated (r=0.25) to OCBI. PE is not significantly correlated to either of the individual performance variables.

2. HYPOTHESES TESTING

Prior to testing the hypotheses, the effect of the socio-demographic variables on the mediating and dependent variables was explored. A comparison of the means was conducted for the effect of employee gender on all variables included in the study (LMX, ELB, PE, JIS, IRP and OCBI) and no difference of the means was detected, indicating that employee gender does not influence ratings for the study variables. However, the bivariate correlations indicated that there was a weak, but significant correlation between employee age and tenure and the variables LMX, ELB and JIS. Testing of the effect of supervisor gender on evaluations of IRP and OCBI was also performed indicating that supervisor gender was not an influential factor in their ratings of employee performance. The relationship tenure was also included in the socio-demographic variables. No significant correlations were found between relationship tenure and the study variables. Given these findings, only employee age and tenure were used as control variables in the multiple linear regression analyses performed.

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[4] Categorization of the significance of the correlations is based on Cohen (1999).

Both hypotheses 1 and 2 propose that JIS mediates the influence of the leadership domain variables (i.e., LMX, ELB and PE) on employee performance (in-role and organizational citizenship behaviours directed at an individual). Mediation was tested using Baron and Kenny's (1986) multiple hierarchical regression procedure presented in Chapter 3, section 3.

Table 5 - Regression analysis of leadership domain variables on job involvement in the work setting

Step	Variable entered	Job involvement in the work setting (JIS)			
		B	*SE*	β	ΔR^2
1	Employee Age	-.01	.01	.15	
	Employee Tenure	-.01	.01	-.12	
					.04*
2	Empowering leadership (ELB)	.05	.10	.07	
	Leader-member exchange (LMX)	.16	.10	.24[a]	
	Psychological empowerment (PE)	.50	.07	.46***	
					.36***

Note. Step 1: F (2, 143) = 4.223, *ns*; Step 2: F (5, 140) = 20.441, $p < .001$.
[a]p<.10; * $p < .05$; ** $p < .01$; *** $p < .001$

Hypothesis 1a and 2a represent the first step of this method, which consists of demonstrating that the relationship between the independent leadership domain variables and the mediating variable of JIS is significant. The detailed results are presented in Table 5. With employee age and tenure controlled, the regression is significant, and the leadership domain variables explain 36% of the variation of JIS. PE and LMX are the only variables that are significant in the presence of the other variables included in the regression model. Thus, in the particular context of this study, psychological empowerment and leader-member exchange are the only variables that account for variation in JIS in the presence of the other variables, with age and tenure controlled. While psychological empowerment, empowering leadership behaviours and leader-member exchange all

independently influence job involvement in the work setting, when all three variables are present, PE and LMX are the only variables that are significant in explaining variation in JIS.

Hypothesis 1b and 2b represent the second step of Baron and Kenny's (1986) mediation procedure, which consists of demonstrating that the relationship between the independent leadership domain variables and the dependent individual performance variables is significant.

Table 6 - Hierarchical regression analysis for mediation of the relationship among leadership domain variables and individual performance variables by job involvement in the work setting

Step	Variable entered	In-role performance (IRP)				Organizational Citizenship Behaviors (OCBI)			
		B	*SE*	β	ΔR^2	*B*	*SE*	β	ΔR^2
1	Employee Age	-.01	.01	-.21		-.01	.01	-.18	
	Employee Tenure	.00	.01	.04		.00	.01	.04	
					.01				.00
2	Empowering leadership (ELB)	.12	.21	.16		-.32	.25	-.35	
	Leader-member exchange (LMX)	.17	.19	.24		.51	.23	.62*	
	Psychological empowerment (PE)	.13	.12	.12		-.03	.15	-.02	
					.14**				.07[a]
3	Empowering leadership (ELB)	.18	.21	.24		-.21	.23	-.24	
	Leader-member exchange (LMX)	.09	.20	.13		.31	.22	.39	
	Psychological empowerment (PE)	.06	.14	.05		-.20	.16	-.17	
	Job involvement-setting (JIS)	.04	.15	.04		.41	.18	.35*	
					-.05*				.04*

Note. For IRP, Step 1: F (2, 72) = 1.00, *ns*; Step 2: F (5, 68) = 3.47, $p < .05$; Step 3: F (5, 70) = 2.50, $p < .05$. For OCBI, Step 1: F (2, 72) = 1.36, *ns*; Step 2: F (5, 68) = 2.02, $p < .100$; Step 3: F (5, 70) = 2.93, $p < .05$.
[a]p<.10; * $p < .05$; ** $p < .01$; *** $p < .001$

For Hypothesis 1b, this consists of performing a linear regression of ELB, LMX and PE on in-role performance. The analysis indicates that the regression is significant and explains 14% of the variation in in-role performance, with employee age and tenure controlled; however, none of the variables, in the presence of the others, significantly explains variations in IRP (see Table 6 for details). Hypothesis 1b is, therefore rejected. For Hypothesis 2b, a linear regression of ELB, LMX and PE on OCBI, with employee age and tenure controlled, was performed. As reported in Table 6, the regression is significant

and explains 6.6% of the variation[5]. LMX is the only significant variable, in the presence of PE and ELB, in explaining variance in OCBI. Hypothesis 2b is, therefore, partially supported.

The final step in testing for mediation involves adding the mediating variable (JIS) with the independent variables ELB, LMX and PE and completing a final regression analysis on the dependent variables. The details of this final step are also included in Table 6 (step 3). Hypothesis 1c proposes that JIS mediates the relationship of the three leadership domain variables and in-role performance. With the addition of JIS to ELB, LMX and PE, the regression on IRP is significant ($p=0.039$) and explains 9.1% of the variation in in-role performance; however, none of the variables in the presence of the others are significant in explaining the variation in IRP. This result indicates that there are perhaps moderating effects, and/or other factors that are present that were not accounted for in the present study. The model of mediation demonstrates less explanatory power than the direct relationship of the independent variables to IRP. Mediation is not demonstrated, and hence Hypothesis 1c is rejected.

Hypothesis 2c proposed that JIS mediates the relationship of the three independent variables and OCBI. With JIS included, the regression was significant and the regression explains 11% of the variation in OCBI (an additional 4% of explanatory power than the direct relationship of the leadership domain variables on OCBI). JIS is the only variable that remains significant in the presence of the other variables. Full mediation of LMX is demonstrated, thus partially supporting Hypothesis 2c.

[5] Increasing the significance level (alpha) to 0.1 reduces the risk of a Type 2 error; that is rejecting the regression as non-significant in the population when in fact it is. Given the small sample size, increasing alpha allows smaller effects to be seen in the analysis.

CHAPTER FIVE - DISCUSSION

The objective of this study was to investigate critical role of the first line supervisor in a lean environment. Using a multi-domain model of leadership suggested by Graen and Uhl-Bien (1995), the effect of empowering leadership behaviours (ELB; leader domain), leader-member exchange (LMX; relation domain) and psychological empowerment (PE; follower domain) on individual in-role performance (IRP) and organizational behaviours directed towards individuals (OCBI) was investigated. Based on the theoretical framework presented in Chapter Two, it was suggested that job involvement in the work setting (JIS) would mediate these relationships. Findings indicate that PE and LMX are significant in explaining variations in JIS, and JIS fully mediates the relationship of LMX and OCBI supporting Hypothesis 2. No mediation by JIS was found between the three domains of leadership and IRP, therefore Hypothesis 1 was rejected. A discussion of these results follows.

1. DISCUSSION OF RESULTS

Looking first to the results of the preliminary analyses, several interesting relationships were found. To begin, JIS was found to be significantly correlated to IRP and OCBI (r=0.25 and r=0.33 respectively). Similarly, Rotenberry and Moberg (2007) found that job involvement (both role and setting) was significantly related to in-role performance and OCBs (both directed to the organization and the individual). Their results indicate the relationship of JI to IRP was weak (r=0.15); the relationship of JI to OCBO was also weak (r=0.13); while the relationship to OCBI was modest (r=0.32). In the current study, only job involvement-setting was evaluated, and yet the results are very similar, indicating that in the context of this study (a lean environment), JIS predicts individual performance results to the same extent as JIS and JIR in the context of the Rotenberry and Moberg (2007) study. In other words, in a lean context, JIS (engagement in one's workgroup) is a significant factor in individual performance ratings. This is in line with the literature on lean management, which emphasizes teamwork for group problem solving and continuous

improvement, and demonstrates a relationship that has not, to our knowledge, been previously studied.

Another result of interest in the preliminary analyses concerns the very strongly correlated variables of LMX and ELB. Dulebohn et al. (2012) indicate that this may be due to the fact that the scales for leadership behaviour and for LMX are more empirically similar than conceptually. As mentioned by these authors, a variety of scholars have questioned whether LMX scales really measure social exchange as defined by Blau in 1964. They suggest using a more recently developed scale by Bernerth and his colleagues (2007) that more clearly focuses on the exchange process and reciprocity and distinguishes more clearly between LMX and leadership behaviours. Hence, it would be interesting to examine empowering leadership behaviours in conjunction with this exchanged-based measure of LMX, to determine if the variables remain as strongly correlated.

Now turning to the hypotheses tests. The results of this study demonstrate that two of the three domains of leadership (follower and relational) are significant in explaining the level of job involvement-setting, as revealed by the analyses related to Baron and Kenny's first step of regression analysis for mediation (Hypotheses 1a and 2a). Both LMX and PE are significant in explaining variance in JIS when all three leader domain variables are present. The fact that ELB was not found to be significant in accounting for variation in JIS in the presence of the other variables is somewhat surprising, given that job involvement was significantly related to supervisory behaviours such as participative decision making and consideration in the meta-analytic study by Brown (1996). In that study, participative decision-making was strongly correlated with job involvement ($r=0.56$) and consideration modestly correlated ($r=0.27$). An explanation for this surprising result may be found in the fact that the meta-analysis did include neither leader-member exchange nor psychological empowerment as antecedents of job involvement. The result of the present study is, therefore, an interesting addition to the understanding of the effects of various facets of leadership on employee outcomes. The relationship between the leader and subordinate is important in predicting variance in JIS, as is the psychological mindset of empowerment of the followers, and more so than empowering leadership behaviours (which includes participative decision-making).

Hypothesis 1 posited that job involvement-setting would mediate the relationship between the three domains of leadership and individual performance, operationalized as in-role performance (IRP). Hypothesis 1b, the second step of the Baron and Kenny (1986) approach to testing mediation was rejected. The regression of the three leader domain variables (ELB, LMX and PE) on in-role performance was significant, however none of the three variables were significant in predicting variations in IRP, and therefore mediation by JIS was not possible to demonstrate. Testing of Hypothesis 1c, in fact demonstrated that the inclusion of JIS in the linear regression diminished the explanatory power of the model.

Hypothesis 2 proposed that job involvement in the work setting would mediate the relationship between the three domains of leadership and organizational citizenship behaviours (targeted at an individual; OCBIs). Hypothesis 2a was supported. Hypothesis 2b was partially supported. The regression of the three leadership domain variables on OCBI was significant, however only LMX was significant in the presence of the ELB and PE in explaining variations in OCBI. Hypothesis 2c demonstrates that job involvement-setting acts as a full mediator between the relational leadership domain of LMX and OCBI. The variable of job involvement-setting was chosen for this study, given the context of lean philosophy, and the importance of teamwork. The results indicate that it is an important variable, and influences individual performance in terms of organizational citizenship behaviours directed at the individual.

The overall results of the study confirm the supposition that leadership is a complex construct, requiring a multi-domain approach to explain individual performance. The domain variables of LMX and PE were significant variables in predicting JIS. The significant and very strong correlation of ELB and LMX may indicate that from the viewpoint of the employee these two constructs are almost the same thing, perhaps explaining why ELB may not have been a significant factor in explaining variances of JIS. The influence of LMX on OCBIs is mediated by JIS. Contrary to other research, in the present study PE is not directly correlated to individual performance, neither IRB nor OCBI. The four cognitions of meaning, competence, autonomy and self determination that define the construct of PE are important in the current context, only in that they explain a significant portion of the variation in the employee's perception of their involvement in the

work setting – a key aspect of the lean organization involved in the study. One plausible explanation for this finding concerns the focus of the current study on first line supervisors. This means that the employees that participated are front line employees working on the shop floor. While the shop floor employees are given considerable autonomy in the improvement activities, and the creation of standard work methods, autonomy in the actual work that is done is considerably less. In the study that found a significant correlation between PE and individual performance (Seibert et al., 2004), the participants were professional workers. Autonomy in this type of context would generally be much greater. Therefore, first line supervisors should facilitate PE, in order to enhance involvement in the work setting, which will lead to individual performance displayed through organizational citizenship behaviours.

2. PRACTICAL APPLICATIONS

The role of the first-line supervisor is important in a lean environment. Encouraging participation, facilitating psychological empowerment and creating high quality relationships with subordinates are all significant factors for employee attitudes and behaviours.

In many manufacturing organizations, seniority and technical competence are often prioritized over managerial/leadership potential in the selection of supervisors and managers (Barton & Delridge, 2005). In a lean environment, technical competencies alone are not enough. Within environments of continuous improvement, the emphasis is on developing and harnessing the collective wisdom of front-line employees. First-line supervisors are, therefore, critical. It is important for organizations that have moved to a lean management system, or those that are in the process of implementation, to invest in the selection and development of first-line supervisors in this vital and changing role.

In an empirical research, Bhasin (2012) summarized key barriers to lean implementation in the manufacturing sector. The number one barrier across all of the organizations identified, through surveys and site visits, was insufficient supervisory skills to implement lean. While no details on the specific skills that are lacking are provided in Bhasin's article, the current study highlights that the three domains of leadership (leader,

follower and relational) are important factors for employee involvement in a team setting, and for individual organizational citizenship behaviours. The scientific and professional literatures emphasize the importance of developing the appropriate leadership behaviours for enhanced performance. Based on the results of the current study, development of first-line supervisors should emphasize how supervisors can create high quality relationships and facilitate employee psychological empowerment, in order to enhance involvement in a team setting and, hence, individual performance[6]. We believe that these suggestions are applicable not only to a lean context similar to that of the study, but also to other contexts where employee participation and teamwork are valued, such as organizations that have implemented high performance work practices.

3. LIMITATIONS AND FUTURE RESEARCH

First and foremost, caution should be taken in terms of generalization of the results. As the study was cross-sectional in nature, causation cannot by determined. In addition, while all facilities of the study are guided by the lean philosophy, not all facilities are at the same level of maturity in terms of implementation. However, all facilities have been guided by the lean management principles for a minimum of one year, and the bivariate correlations indicate that the length of time since implementation is not related to any of the other critical variables. The study was performed in North American facilities; hence the results may not be generalized to organizations from other national cultures as they may have different conceptions of leadership. Note also that organizational culture may differ slightly from one participating facility to another, but we did not control for that factor.

Second, the sample size was, unfortunately, quite small. While adequate for the statistical analyses performed, a larger sample size would have allowed the use of 1) a smaller significance level, thus decreasing the possibility of Type I errors, 2) more sophisticated analytic approaches, and 3) detection of smaller effect sizes.

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[6] Examining the antecedents of PE and LMX was outside the scope of the present study, however a vast body of scientific literature exists on both of these variables that would be useful to practitioners for building a development program for first line supervisors.

Third, since the publication of the Graen and Uhl-Bien (1995) article, research on leadership has continued to grow. Hernandez, Eberly, Avolio and Johnson (2011) performed a qualitative review of leadership theory, and expanded the taxonomy of leadership to not only include the leader, follower and relational domains, but also the domains of context and groups and teams. While the present study looked at leaders, followers and dyads, it did not take into account the collective domains of groups and teams, although these may be particularly important in the context of lean manufacturing. Caution is warranted when extending results of the individual outcomes to the team level due to a difference in the levels of analysis, and social interactions that are not captured at the individual level (Gully, Incalcaterra, Joshi, & Beaubien, 2002). However, with a larger sample size, several other types of analysis could have been performed concerning the impact of the multi-domain leadership framework on team outcomes.

In a similar vein, the present research studied dyads within work groups, but not the aggregation of these dyadic relationships to the group or organizational level. In a lean environment, the role of the first line supervisor is to work with all team members to achieve team goals. Graen and Uhl-Bien pose the question in their 1995 article on how differentiated LMX relationships interact together and what their combined effect is on group level outcomes. Martin et al. (2010) provide references to a variety of research that has been conducted, since Graen and Uhl-Bien published their article, at the group and organizational level. Several authors demonstrate a positive relationship between LMX and team level attitudes and beliefs such as team potency (Boies & Howell, 2006), team empowerment (Chen et al., 2007), and team commitment (Bakar, Mustaffa & Mohamad, 2009). Other studies indicate that individual level attitudes and performance may aggregate to the team level (e.g., Chen et al., 2007). Given the importance of the team within a lean management system, the impact of a multi-domain approach to leadership on team level outcomes would be an interesting avenue to explore in future research.

Fourth, the current study, similar to the majority of LMX research, concentrated on the employee evaluation of LMX. Dulebohn et al. (2012) indicate that less than 5% of the studies used in their meta-analysis reported supervisor-rated LMX. LMX congruence has not been extensively studied, but as suggested by Cogliser, Schriesheim, Scandura and

Gardner (2009), differential ratings of LMX quality by leaders and subordinates are related to performance and attitudes. Further investigation on the congruence between the leader and follower perceptions of LMX, its impact on employee attitudes and individual performance, within a multi-domain approach to leadership would be an interesting avenue to explore.

Finally, common method variance (CMV) is a potential limitation in this study. CMV is most often raised when cross-sectional, self-report surveys are used, however it is an issue in all mono-method studies (Spector, 2006). CMV refers to the variance attributable to the measurement method, and not to the constructs being measured. Measuring two or more variables with the same method may inflate the observed correlations due to shared biases. In the current study, four variables out of five were measured by employees (i.e., empowering leadership behaviours, LMX, psychological empowerment, and job involvement). Personality variables such as social desirability and negative affect may be a source of CMV if the constructs under study are susceptible to being influenced by these particular personality traits (Spector, 2006). Future studies should consider measuring and controlling for these traits. Also, although as mentioned above less than 5% of LMX studies use supervisor-rated LMX (Dulebohn et al., 2012), testing the mediation hypotheses presented in the current study using supervisor perception of LMX rather than employee-rated LMX would have contributed to address CMV issues. Note, however, that the dependent variables in our model (i.e., in-role performance and OCBIs) are measured by the supervisor, thereby alleviating CMV concerns.

CHAPTER SIX - CONCLUSION

The current research study set out, through a quantitative research design, to understand the role of first-line supervisors in facilitating individual performance within a lean context. Due to the complexity of leadership, a multi-domain approach (Graen & Uhl-Bien, 1995) was used. It was demonstrated that leader behaviours (and more specifically empowering leadership behaviours; ELB), follower cognition of psychological empowerment (PE), and the relationship of the follower-leader dyad (LMX) are all important factors in predicting individual performance. As found in much of the scientific research, the link between the domains of leadership and performance is not necessarily direct. The present study demonstrated that job involvement in the work setting (JIS) mediates the relationship between the three leader domains and organizational citizenship behaviours directed at individuals (OCBIs). Also of significance, leader-member exchange (LMX) and psychological empowerment (PE) are the two significant leadership domain variables that account for variations in JIS, while empowering leadership behaviours (ELB) and the quality of the leader-member exchange are significantly related to in-role performance.

The research study performed attempts to fill a gap in the literature concerning the role of the first-line supervisor in a lean environment, where respect for people and continuous improvement are the two fundamental pillars of the management philosophy. The findings are interesting, and indicate that the relational and follower domain, operationalized by LMX and PE in the study, are more important to enhancing JIS than the leader domain variable of ELB. Development programs for supervisors should therefore emphasize skills for relationship building and for facilitating psychological empowerment of team members.

The study also reinforces the importance of job involvement in the work setting in relation to individual performance operationalized as organizational citizenship behaviours targeted at the individual, particularly in a lean context. The relationship of JIS to performance, particularly to OCBI's, does not appear to have been previously studied.

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APPENDIX A – ETHICS CERTIFICATE

UNIVERSITÉ DE SHERBROOKE

Comité d'éthique de la recherche
Lettres et sciences humaines
Sherbrooke (Québec) J1K 2R1

PAR COURRIER ÉLECTRONIQUE

Le 3 juin 2013

Madame Joanne Roberts
Étudiante
Maîtrise en intervention et changement organisationnel
Faculté d'administration

Objet : Évaluation de votre projet de recherche par le Comité d'éthique de la recherche

Madame,

Le Comité d'éthique de la recherche Lettres et sciences humaines a reçu les modifications demandées concernant votre projet de recherche intitulé **« Lean management philosophy and its impact on employee attitudes and performance: the critical role of first line supervisors »**.

À la lumière des informations fournies et à la suite de l'examen des documents soumis, le comité juge que votre projet respecte les règles éthiques de la recherche.

En terminant, je vous rappelle qu'il est de votre responsabilité d'informer le comité de toutes modifications qui pourraient être apportées à votre projet.

Le comité vous remercie d'avoir soumis votre demande d'approbation à son attention et vous souhaite le plus grand succès dans la réalisation de cette recherche.

Dominique Lorrain
Présidente du comité d'éthique de la recherche
Lettres et sciences humaines

c. c. Guylaine Landry, directrice de recherche
Mario Fortin, vice-doyen à la recherche, Faculté d'administration
Daniel-Louis Bilodeau, adjoint au vice-décanat à la recherche, Faculté d'administration

DL/cc

APPENDIX B – EMPLOYEE SURVEY

Empowering Leadership Behaviors (Arnold et al., 2000)
My supervisor:
1. Sets high standards for performance by his/her own behaviour
2. Sets a good example by the way he/she behaves
3. Leads by example
4. Encourages work group members to express ideas/suggestions
5. Listens to my work group's ideas and suggestions
6. Uses my work group's ideas to make decisions that affect us
7. Helps my work group see areas in which we need more training
8. Suggest ways to improve my work group's performance
9. Encourages work group members to solve problems together
10. Tells my work group when we perform well
11. Helps my work group focus on our goals
12. Explains company goals
13. Explains how my work group fits into the company
14. Explains the purpose of company's policies to my work group
15. Explains his/her decisions and actions to my work group.
16. My supervisor has stressed the importance of lean enterprise management
17. Cares about work group members' personal problems
18. Show concern for work group members' well-being
19. Stays in touch with my work group
20. Gets along with my work group members

Job involvement (setting) (Paullay et al., 1994)
1. I feel myself to be part of the team on which I work.
2. This work environment really inspires the very best in me in the way of job performance.
3. There is something about the team on which I work that makes me want to do my best.
4. I just do my own job and forget about such things as work-related parties or activities. (R)
5. I enjoy doing things with my co-workers.
6. I really feel as if the team's problems are my problems.
7. I am willing to put in a great deal of effort beyond that normally expected in order to help the hospital be successful.
8. In general I am involved in my "work environment" (for example, the team, or the hospital in general).
9. If once a week, after the work day is over, the administration had the employees get together in groups for the purpose of discussing possible job changes or problems, I would remain after quitting time to participate in these discussions.
10. If I had the choice between going to the company picnic or staying home, I would probably stay home. (R)

11. I would prefer to work in a different setting or organization. (R)
12. At work, I am very involved in what goes on with others (for example, your co-workers or supervisor).
13. I am extremely glad that I chose this hospital to work for, over the other places I was considering at the time I joined.
14. I am willing to put in a great deal of effort beyond that normally expected in order to help my team be successful.

LMX (Scandura and Graen, 1984)

1. I know where I stand with my leader, how satisfied my leader is with me.
2. My leader understands my job problems and needs.
3. My leader recognizes my potential.
4. My leader would use his/her power to help me solve problems in my work.
5. My leader would "bail me out" if needed, even at his/her own expense.
6. I have enough confidence in my leader that I would defend and justify his/her decisions if he/she were not present to do so.
7. My working relationship with my leader is extremely effective.

Psychological Empowerment (Spreitzer, 1995)

1. The work I do is very important to me
2. My job activities are personally meaningful to me
3. The work I do is meaningful to me
4. I am confident about my ability to do my job
5. I am self assured about my capabilities to perform my work activities
6. I have mastered the skills necessary for my job.
7. I have significant autonomy in determine how I do my job
8. I can decide on my own how to go about doing my work
9. I have considerable opportunity for independence and freedom in how I do my job.
10. My impact of what happens in my workgroup is large
11. I have a great deal of control over what happens in my workgroup.
12. I have significant influence over what happens in my workgroup.

APPENDIX C - SUPERVISOR SURVEY

In Role Behaviors (Williams and Anderson, 1991)
This employee:
1. Adequately completes assigned duties
2. Fulfills responsibilities specified in job description
3. Performs tasks that are expected of him/her.
4. Meets formal performance requirements of the job.
5. Engages in activities that will directly affect his/her performance evaluation.
6. Neglects aspects of the job he/she is obligated to perform. (R)
7. Fails to perform essential duties

Organization Citizenship Behaviors (Individual) (Williams and Anderson, 1991)
This employee:
1. Helps others who have been absent
2. Helps others who have heavy workloads
3. Assists supervisor with his/her work (when not asked)
4. Takes time to listen to co-workers problems and worries
5. Goes out of his/her way to help new employees.
6. Takes a personal interest in other employees
7. Passes along information to co-workers